



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,874	11/21/2001	Wing L. Sung	GOWL-018/00US/306506-2025	2196
58249 7590 02/08/2008 COOLEY GODWARD KRONISH LLP ATTN: Patent Group Suite 1100 777 - 6th Street, NW WASHINGTON, DC 20001			EXAMINER RAGHU, GANAPATHIRAM	
			ART UNIT 1652	PAPER NUMBER
			MAIL DATE 02/08/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Advisory Action
Before the Filing of an Appeal Brief**

Application No.

09/990,874

Applicant(s)

SUNG, WING L.

Examiner

Ganapathirama Raghu

Art Unit

1652

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 07 January 2008 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires 4 months from the mailing date of the final rejection.
b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a):

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
(b) ☐ They raise the issue of new matter (see NOTE below);
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☒ Applicant's reply has overcome the following rejection(s): Double patenting rejection of claims 1, 2, 4, 9 and 48.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
The status of the claim(s) is (or will be) as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: 1,2,4,7,9,12-14,18,21-23,30-32,37,39-41,44,48,49 and 56-71.
Claim(s) withdrawn from consideration: _____.


AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
See Continuation Sheet.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

Continuation of 11. does NOT place the application in condition for allowance because: Applicants' amendments to claims and arguments are not persuasive to overcome the rejection of claims 1,2,4,7,9,12-14,18,21-23,30-32,37,39-41,44,48,49 and 56-71 under 112 first paragraph for enablement and written-description rejection. Examiner continues to hold the position that the breadth encompassed as a result of the phrase "comprising" (open language) allows any number of additional changes, even if claims were clearly limited to variants that are *Trichoderma reesei* xylanase II enzymes and as a result claims still encompass number of variants and would be an undue burden to one skill in the art to make, identify variants with desired biological characteristics and use the variants for desired purposes. Applicants' arguments "the transitional phrase comprising would not allow any number of additional changes to the amino acid sequence as alleged by examiner, since this language must be read in context with other features present in the claim" is not persuasive as claims are given the broadest interpretation and under this interpretation when there are no defined structural features or a reference to a parent sequence, the modified *Trichoderma reesei* xylanase II can potentially have any number of structural features with no correlation to structure-function.


REBECCA E. PROUTY
PRIMARY EXAMINER
GROUP 1800
1600

Replacement page

Ca 23 S AFNTQAAP 31
Cs 1 G 1

Tr2#		10	20	30	40	
Bp	1	RTITNNEMGN	HSGYDYELWK	DYGNT-SMTL	NNGGAFSAGW	N--NIGNA 45
Ca	10	KTITSNEIGV	NGGYDYELWK	DYGNT-SMTL	KNGGAFSCQW	S--NIGNA 54
Fs	1	NSSVTGNVG	SSPYHYEIWY	QGG-NNSMTF	YDNGTYKASW	N--GTNDF 44
Cs	2	RIIYDNETGT	HGGYDYELWK	DYGNT-IMEL	NDGGTFSCQW	S--NIGNA 46
Rf	1	SAADQQTRGN	VGGYDYEMWN	QNGQGQASMN	PGAGSFTCSW	S--NIENF 46
Tr2	1	QTIQPGTGY	NNGYFYSYWN	DGHGGVITYN	GPGGQFSVNW	S--NSGNF 45
Tv	1	QTIQPGTGF	NNGYFYSYWN	DGHGGVITYN	GPGGQFSVNW	S--NSGNF 45
Th	1	QTIGPGTGY	SNGYYSYWN	DGHAGVITYN	GGGGSFTVNW	S--NSGNF 45
Sc	1	SGTPSSSTGT	DGGYYSWWT	DGAGDATYQN	NGGGSYTLTW	SG--NNGNL 46
An	1		S AGINYVQNYN	GNLGDFTY-D	ESAGTFSMYW	EDGVSSDF 38
Ak	1		S AGINYVQNYN	GNLADFTY-D	ESAGTFSMYW	EDGVSSDF 38
At	1		S AGINYVQNYN	QNLGDFTY-D	ESAGTFSMYW	EDGVSSDF 38
Tr1	1		ASINYDQNYQ	TGG-QVSY-	PSNTGFSVNW	N--TQDDF 34
Aa	1	RSTPSSTGE	NNGYYSFWT	DGGGDVITYN	GNAGSYSVEW	S--NVGNF 45
Ss	1	ATTIT-NETGY	D-GMYYSFWT	DGGGSVSMTL	NGGGSYSTRW	T--NCGNF 45
SlB	1	DTVVTTNQEGT	NNGYYSFWT	DSQGTVSMNM	GSGGQYSTSW	R--NTGNF 47
SlC	1	ATTITTNQTGT	D-GMYYSFWT	DGGGSVSMTL	NGGGSYSTQW	T--NCGNF 46
Tl	1	QTTPNSEGW	HDGYYSWWS	DGGAQATYTN	LEGGTYEISW	G--DGGNL 45
Tf	1	AVTSNETGY	HDGYFYSFWT	DAPGTVSMEL	GPGGNYSTSW	R--NTGNF 45
Bc	1		ASTDYWQNWT	DGGGIVNAVN	GSGGNYSVNW	S--NTGNF 36
Bs	1		ASTDYWQNWT	DGGGIVNAVN	GSGGNYSVNW	S--NTGNF 36

FIGURE 1

Replacement page

Tr2#		50		60		70		80	
Bp	46	LFRK-GKKFD	ST-RTHHQLG	NISINYNASF	N-PSGNSYLC	VYGWTQSP	90		
Ca	55	LFRK-GKKFN	DT-QTYKQLG	NISVNYNCNY	Q-PYGNSYLC	VYGWTSSP	99		
Fs	45	LARV-GFKYD	EK-HTYEELGP	IDAYYKWSKQ	GSAGGYNYIG	IYGWTVDP	91		
Cs	47	LFRK-GRKFN	SD-KTYQELG	DIVVEYGCDY	N-PNGNSYLC	VYGWTRNF	91		
Rf	47	LARM-GKNYD	SQKKNYKAFG	NIVLTYDVEY	T-PRGNSYMC	VYGWTRNP	92		
Tr2	46	VGGK-GWQPG	TKNKV----	---INFS-GS	YNPNGNSYLS	VYGWSRNP	83		
Tv	46	VGGK-GWQPG	TKNKV----	---INFS-GS	YNPNGNSYLS	VYGWSRNP	83		
Th	46	VGGK-GWQPG	TKNKV----	---INFS-GS	YNPNGNSYLS	IYGWSRNP	83		
Sc	47	VGGK-GWNPG	AASRS----	---ISYS-GT	YQPNGNSYLS	VYGWTRSS	84		
An	39	VVGL-GWTTG	SSNA-----	---ITYSAEY	SASGSSSYLA	VYGWVNYP	76		
Ak	39	VVGL-GWTTG	SSNA-----	---ITYSAEY	SASGSSSYLA	VYGWVNYP	76		
At	39	VVGLGWTG	SSNA-----	---ITYSAEY	SASGSASYLA	VYGWVNYP	77		
Tr1	35	VVGW-GWTTG	SSAP-----	---INFGGSF	SVNSGTGLLS	VYGWSTNP	72		
Aa	46	VGGK-GWNPG	SAKD-----	---ITYSGNF	T-PSGNGYLS	VYGWTTDP	82		
Ss	46	VAGK-GWANG	GR-RT-----	---VRYT-GW	FNPNGNGYGC	LYGWTSP	82		
SlB	48	VAGK-GWANG	GR-RT-----	---VQYS-GS	FNPNGNAYLA	LYGWTSP	84		
SlC	47	VAGK-GWSTG	DGN-----	---VRYN-GY	FNPVNGNGYGC	LYGWTSP	82		
Tl	46	VGGK-GWNPG	LNARA-----	---IHFE-GV	YQPNGNSYLA	VYGWTRNP	83		
Tf	46	VAGK-GWATG	GR-RT-----	---VTYS-AS	FNPNGNAYLT	LYGWTRNP	82		
Bc	37	VVGK-GWTTG	SPFRT-----	---INYNAGV	WAPNGNGYLT	LYGWTRSP	75		
Bs	37	VVGK-GWTTG	SPFRT-----	---INYNAGV	WAPNGNGYLT	LYGWTRSP	75		

Tr2#		90		100		110		120		130
Bp	91	LAEYYIVDSW	GTyr-PT--G	AYKGSFYADG	GTyDIYETTR	VNQPSIIG	135			
Ca	100	LVEYYIVDSW	GSWRPP--GG	TSKGTITVDG	GIYDIYETTR	INQPSIQG	145			
Fs	92	LVEYYIVDDW	FNKPGANLLG	QRKGEFTVDG	DYeiWQNTTR	VOQPSIKG	139			
Cs	92	LVEYYIVESW	GSWRPP--GA	TPKGTITQWMAG	TYeiYETTR	VNQPSIDG	138			
Rf	93	LMEYYIVEGW	GDWRPPGNDG	EVKGTVSANG	NTYDIRKTMR	YNQPSLDG	140			
Tr2	84	LIEYYIVENF	GTYN-PSTGA	TKLGEVTS DG	SVYDIYRTQR	VNQPSIIG	130			
Tv	84	LIEYYIVENF	GTYN-PSTGA	TKLGEVTS DG	SVYDIYRTQR	VNQPSIIG	130			
Th	84	LIEYYIVENF	GTYN-PSTGA	TKLGEVTS DG	SVYDIYRTQR	VNQPSIIG	130			
Sc	85	LIEYYIVESY	GSYD-PSSAA	SHKGSVTCNG	ATYDILSTWR	YNAPSIDG	131			
An	77	GAEYYIVEDY	GDYN-PCSSA	TSLGTVYSDG	STYQVCTDTR	INEPSITG	123			
Ak	77	QAEYYIVEDY	GDYN-PCSSA	TSLGTVYSDG	STYQVCTDTR	TNEPSITG	123			
At	78	QAEYYIVEDY	GDYN-PCSSA	TSLGTVYSDG	STYQVCTDTR	INEPSITG	124			
Tr1	73	LVEYYIMEDN	HNY--PAQ-G	TVKGTVTS DG	ATYTIWENTR	VNEPSIQG	117			
Aa	83	LIEYYIVESY	GDYN-PGSGG	TTRGNVSSDG	SVYDIYTATR	TNAPSIDG	129			
Ss	83	LVEYYIVDNW	GSYR-PT--G	ETRGTVHSDG	GTyDIYKTTR	YNAPSVEA	127			
SlB	85	LVEYYIVDNW	GTyr-PT--G	EYKGTVTS DG	GTyDIYKTTR	VNKPSVEG	129			
SlC	83	LVEYYIVDNW	GSYR-PT--G	TYKGTVSSDG	GTyDIYQTTR	YNAPSVEG	127			
Tl	84	LVEYYIVENF	GTyD-PSSGA	TDLGTVES DG	SIYRLGKTTR	VNAPSIDG	130			
Tf	83	LVEYYIVESW	GTyr-PT--G	TYMGTVTTDG	GTyDIYKTTR	YNAPSIEG	127			
Bc	76	LIEYYVWDSW	GTyr-PT--G	TYKGTVKSDG	GTyDIYTTTR	YNAPSIDG	120			
Bs	76	LIEYYVWDSW	GTyr-PT--G	TYKGTVKSDG	GTyDIYTTTR	YNAPSIDG	120			

FIGURE 1 CONT'D

Replacement page

Tr2#		140	150	160	
Bp	136	-IATFKQYWS	VRQTKRTS--	-----GTVS	VSAHFRKWES LGMPM-GK 173
Ca	146	-NTTEKQYWS	VRRTKRTS--	-----GTIS	VSKHFAAWES KGMPM-GK 183
Fs	140	-TQTFQYFS	VRKSARSC--	-----GHID	ITAHMKKWE LGMKM-GK 177
Cs	139	-TATFQYWS	VRTSKRTS--	-----GTIS	VTEHFKOWER MGMRM-GK 176
Rf	141	-TATFQYWS	VRQTSQSANN	QTNMKGID	VSKHFAWSA AGLDMSGT 187
Tr2	131	-TATFQYWS	VRNRHR-S-S	-----GSVN	TANHFNAAQ QGLTL-GT 168
Tv	131	-TATFQYWS	VRNRHR-S-S	-----GSVN	TANHFNAAQ QGLTL-GT 168
Th	131	-TATFQYWS	VRNRHR-S-S	-----GSVN	TANHFNAAQ HGLTL-GT 168
Sc	132	-TQTFQYWS	VRNPCKAPGG	SIS---GTV	VQCHFAWKG LGMNLGSE 175
An	124	-TSTFTQYFS	VRESTRTS--	-----GTVT	VANHFNAAQ HGFGN-SD 161
Ak	124	-TSTFTQYFS	VRESTRTS--	-----GTVT	VANHFNAAQ HGFGN-SD 161
At	125	-TSTFTQYFS	VRESTRTS--	-----GTVT	VANHFNAAH HGFGN-SD 163
Tr1	118	-TATFNQYIS	VRNSPR-T-S	-----GTVT	VQNHFNAAQ LGLHLGQM 155
Aa	130	-TQTFQYWS	VRQNKV-VG-	-----GTVT	TSNHFNAAK LGMNL-GT 167
Ss	128	-PAAFDQYWS	VRQSKVT--S	-----GTIT	TGNHFAWAR AGMNMGNF 166
SlB	130	TR-TFDQYWS	VRQSKR-TG-	-----GTIT	TGNHFAWAR AGMPLGNF 168
SlC	128	TK-TFDQYWS	VRQSKVTSGS	-----GTIT	TGNHFAWAR AGMNMGNF 168
Tl	131	TQ-TFDQYWS	VRQDKR-T-S	-----GTVQ	TGCHFAWAR AGLNVNGD 169
Tf	128	TR-TFDQYWS	VRQSKRTS--	-----GTIT	AGNHFAWAR HGMHLGTH 166
Bc	121	DRTTFTQYWS	VRQSKRPTGS	N-----ATIT	FTNHVNAWKS HGMNLGSN 163
Bs	121	DRTTFTQYWS	VRQSKRPTGS	N-----ATIT	FSNHVNAWKS HGMNLGSN 163

Tr2#		170	180	190	
Bp	174	MYETAFTVEG	YQSSGSANVM	TNQLFIGN	201 SEQ ID NO:4
Ca	184	MHETAFNIEG	YQSSGKADVN	SMSINIGK	211 SEQ ID NO:6
Fs	178	MYEAKVLVEA	GGGSGSFDV-	TYFKMT	202 SEQ ID NO:7
Cs	177	MYEVALTVEG	YQSSGYANVY	KNEIRIGANP....	SEQ ID NO:7
Rf	188	LYEVSLNIEG	YRSNGSANVK	SVSV	211 SEQ ID NO:8
Tr2	169	MDYQIVAVEG	YFSSGSASI-	TVS	190 SEQ ID NO:16
Tv	169	MDYQIVAVEG	YFSSGSASI-	TVS	190 SEQ ID NO:17
Th	169	MDYQIVAVEG	YFSSGSASI-	TVS	190 SEQ ID NO:14
Sc	176	HNYQIVATEG	YQSSGTATI-	TVT	197 SEQ ID NO:9
An	162	FNYQVMAVEA	WSGAGSASV-	TISS	184 SEQ ID NO:1
Ak	162	FNYQVMAVEA	WSGAGSASV-	TISS	184 SEQ ID NO:54
At	164	FNYQVMAVEA	WSGAGSAAV-	TISS	185 SEQ ID NO:2
Tr1	156	MNYQVMAVEG	WGGSGSASQ-	SVSN	178 SEQ ID NO:15
Aa	168	HNYQILATEG	YQSSGSSSI-	TIQ	189 SEQ ID NO:19
Ss	167	RYYMINATEG	YQSSGSSSI-	TVSG	189 SEQ ID NO:12
SlB	169	SYMINATEG	YQSSGTSSI-	NVGG.....	SEQ ID NO:10
SlC	169	RYYMINATEG	YQSSGSSNI-	TVSG	191 SEQ ID NO:11
Tl	170	HYYQIVATEG	YFSSGYARI-	TVADVG	194 SEQ ID NO:20
Tf	167	D-YMIMATEG	YQSSGSSNVT	LGTS.....	SEQ ID NO:13
Bc	164	WAYQVMATEG	YQSSGSSNV-	TVW	185 SEQ ID NO:3
Bs	164	WAYQVMATEG	YQSSGSSNV-	TVW	185 SEQ ID NO:5

FIGURE 1 CONT'D

Marked-up Sheet Showing Changes

Ca	23				S	AFNTQAAP	31
Cs	1				G		1
Tr2#		10	20	30	40		
Bp	1	RTITNNEMGN	HSGYDYELWK	DYGNT-SMTL	NNGGAFSAGW	N--NIGNA	45
Ca	32 10	KTITSNEIGV	NNGYDYELWK	DYGNT-SMTL	KNGGAFSCQW	S--NIGNA	76 54
Fs	1	NSSVTGNVG	SSPYHYEIWY	QGG-NNSMTF	YDNGTYKASW	N--GTNDF	44
Cs	2	RIIYDNETGT	HGGYDYELWK	DYGNT-IMEL	NDGGTFSCQW	S--NIGNA	46
Rf	1	SAADQQTRGN	VGGYDYEMWN	QNGQGQASMN	PGAGSFTCSW	S--NIENF	46
Tr2	1	QTIQPGTGY	NNGYFYSYWN	DGHGGVTTYN	GPGGQFSVNW	S--NSGNF	45
Tv	1	QTIQPGTGF	NNGYFYSYWN	DGHGGVTTYN	GPGGQFSVNW	S--NSGNF	45
Th	1	QTIGPGTGY	SNGYYYSYWN	DGHAGVTTYN	GGGGSFTVNW	S--NSGNF	45
Sc	1	SGTPSSTGT	DGGYYYSWWT	DGAGDATYQN	NGGGSYTLTW	SG--NNGNL	46
An	1	S	AGINYVQNYN	GNLGDFTY-D	ESAGTFSMYW	EDGVSSDF	38
Ak	1	S	AGINYVQNYN	GNLADFTY-D	ESAGTFSMYW	EDGVSSDF	38
ATAt	1	S	AGINYVQNYN	QNLGDFTY-D	ESAGTFSMYW	EDGVSSDF	38
Tr1	1		ASINYDQNYQ	TGG-QVSY-	PSNTGFSVNW	N--TQDDF	34
Aa	1	RSTPSSTGE	NNGYYYSFWT	DGGGDVTTYN	GNAGSYSEW	S--NVGNF	45
Ss	1	ATTIT-NETGY	D-GMYYSFWT	DGGGSVSMTL	NGGGSYSTRW	T--NCGNF	45
SlB	1	DTVVTTNQEGT	NNGYYYSFWT	DSQGTVSMNM	GSGGQYSTSW	R--NTGNF	47
SlC	1	ATTITTNQTGT	D-GMYYSFWT	DGGGSVSMTL	NGGGSYSTQW	T--NCGNF	46
Tl	1	QTPNSEGW	HDGYFYSWWS	DGGAQATYTN	LEGGTYEISW	G--DGCNL	45
Tf	1	AVTSNETGY	HDGYFYSFWT	DAPGTVSMEL	GPGGNYSTSW	R--NTGNF	45
Bc	1		ASTDYWQNWT	DGGGIVNAVN	GSGGNYSVNW	S--NTGNF	36
Bs	1		ASTDYWQNWT	DGGGIVNAVN	GSGGNYSVNW	S--NTGNF	36

FIGURE 1

Marked-up Sheet Showing Changes

Tr2#		50		60		70		80	
Bp	46	LFRK-GKKFD	ST-RTHHQLG	NISINYNASF	N-PSGNSYLC	VYGWTQSP		90	
Ca	77 55	LFRK-GKKFN	DT-QTYKQLG	NISVNYNCHY	Q-PYGNSYLC	VYGWTSSP	121 99		
FSFs	45	LARV-GFKYD	EK-HTYEELGPIDAYYKWSKQ	GSAGGYNYIG	IYGWTVDP		91		
Cs	47	LFRK-GRKFN	SD-KTYQELG	DIVVEYGC DY	N-PNGNSYLC	VYGWTRNF		91	
Rf	47	LARM-GKNYD	SQKKNYKAFG	NIVLTYDVEY	T-PRGNSYMC	VYGWTRNP		92	
Tr2	46	VGGK-GWQPG	TKNKV----	---INFS-GS	YNPNGNSYLS	VYGWSRNP		83	
Tv	46	VGGK-GWQPG	TKNKV----	---INFS-GS	YNPNGNSYLS	VYGWSRNP		83	
Th	46	VGGK-GWQPG	TKNKV----	---INFS-GS	YNPNGNSYLS	IYGWSRNP		83	
Sc	47	VGGK-GWNPG	AASRS----	---ISYS-GT	YQPNGNSYLS	VYGWTRSS		84	
An	39	VVGL-GWTTG	SSNA-----	---ITYSAEY	SASGSSSYLA	VYGWVNYP		76	
Ak	39	VVGL-GWTTG	SSNA-----	---ITYSAEY	SASGSSSYLA	VYGWVNYP		76	
At	39	VVGLG-GWTTG	SSNA-----	---ITYSAEY	SASGSASYLA	VYGWVNYP		77	
Tr1	35	VVGW-GWTTG	SSAP-----	---INFGGSF	SVNSGTGLLS	VYGWSTNP		72	
Aa	46	VGGK-GWNPG	SAKD-----	---ITYSGNF	T-PSGNGYLS	VYGWTTDP	83 82		
Ss	46	VAGK-GWANG	GR-RT-----	---VRYT-GW	FNPSGNGYGC	LYGWTSNP		82	
SLB	48	VAGK-GWANG	GR-RT-----	---VOYS-GS	FNPSGNAYLA	LYGWTSNP		84	
SLC	47	VAGK-GWSTG	DGN-----	---VRYN-GY	FNPVGNGYGC	LYGWTSNP		82	
Tl	46	VGGK-GWNPG	LNARA-----	---IHFE-GV	YQPNGNSYLA	VYGWTRNP		83	
Tf	46	VAGK-GWATG	GR-RT-----	---VTYS-AS	FNPSGNAYLT	LYGWTRNP		82	
Bc	37	VVGK-GWTTG	SPFRT-----	---INYNAGV	WAPNGNGYLT	LYGWTRSP		75	
Bs	37	VVGK-GWTTG	SPFRT-----	---INYNAGV	WAPNGNGYLT	LYGWTRSP		75	

Tr2#		90		100		110		120		130
Bp	91	LAEYYIVDSW	GTyr-PT--G	AYKGSFYADG	GTyDIYETTR	VNQPSSIIG		135		
Ca	122 100	LVEYYIVDSW	GSWRPP--GG	TSKGTITVDG	GIYDIYETTR	INQPSIQG	146 145			
Fs	92	LVEYYIVDDW	FNKPGANLLG	QRKGEFTVDG	DTYEIWQNTT	VQQPSIKG		139		
Cs	92	LVEYYIVESW	GSWRPP--GA	TPKGTITQWMAGTYEIIYETTR	VNQPSSIDG		138			
Rf	93	LMEYYIVEGW	GDWRPPGNDG	EVKGTVSANG	NTYDIRKTMR	YNQPSLDG		140		
Tr2	84	LIEYYIVENF	GTYN-PSTGA	TKLGEVTS DG	SVYDIYRTQR	VNQPSSIIG		130		
Tv	84	LIEYYIVENF	GTYN-PSTGA	TKLGEVTS DG	SVYDIYRTQR	VNQPSSIIG		130		
Th	84	LIEYYIVENF	GTYN-PSTGA	TKLGEVTS DG	SVYDIYRTQR	VNQPSSIIG		130		
Sc	85	LIEYYIVESY	GSYD-PSSAA	SHKGSVTCNG	ATYDILSTWR	YNAPSIDG		131		
An	77	GAEYYIVEDY	GDYN-PCSSA	TSLGTVYSDG	STYQVCTDTR	INEPSITG		123		
Ak	77	QAEYYIVEDY	GDYN-PCSSA	TSLGTVYSDG	STYQVCTDTR	TNEPSITG		123		
At	78	QAEYYIVEDY	GDYN-PCSSA	TSLGTVYSDG	STYQVCTDTR	INEPSITG		124		
Tr1	73	LVEYYIMEDN	HNY--PAQ-G	TVKGTVTS DG	ATYTIWENTR	VNEPSIQG		117		
Aa	84 83	LIEYYIVESY	GDYN-PGSGG	TTRGNVSSDG	SVYDIYTATR	TNAPSIDG	130 129			
Ss	83	LVEYYIVDNW	GSYR-PT--G	ETRGTVHSDG	GTyDIYKTTR	YNAPSVEA		127		
SLB	85	LVEYYIVDNW	GTyr-PT--G	EYKGTVTS DG	GTyDIYKTTR	VNKPSVEG		129		
SLC	83	LVEYYIVDNW	GSYR-PT--G	TYKGTVSSDG	GTyDIYQTTR	YNAPSVEG		127		
Tl	84	LVEYYIVENF	GTyD-PSSGA	TDLGTVECDG	SIYRLGKTTR	VNAPSIDG		130		
Tf	83	LVEYYIVESW	GTyr-PT--G	TYMGTVTTDG	GTyDIYKTTR	YNAPSIEG		127		
Bc	76	LIEYYVWDSW	GTyr-PT--G	TYKGTVKSDG	GTyDIYTTTR	YNAPSIDG		120		
Bs	76	LIEYYVWDSW	GTyr-PT--G	TYKGTVKSDG	GTyDIYTTTR	YNAPSIDG		120		

FIGURE 1 CONT'D

Marked-up Sheet Showing Changes

Tr2#		140	150	160	
Bp	136	-IATFKQYWS VRQTKRTS--	-----GTVS	VSAHFRKWES	LGMPM-GK 174173
Ca	168 146	NTTFKQYWS VRRTKRTS--	-----GTIS	VSKHFAAWES	KGMPL-GK 206 183
Fs	140	-TQTFQYFS VRKSARSC--	-----GHID	ITAHMKKWE	LGMMK-GK 178 177
Cs	139	-TATFQYWS VRTSKRTS--	-----GTIS	VTEHFKOWER	MGMRM-GK 177 176
Rf	141	-TATFQYWS VRQTSGSANN	QTNMKG	TID VSKHFDWASA	AGLDMSGT 187
Tr2	131	-TATFYQYWS VRRNHR-S-S	-----GSVN	TANHFNAAWQ	QGLTL-GT 168
Tv	131	-TATFYQYWS VRRTHR-S-S	-----GSVN	TANHFNAAWQ	QGLTL-GT 168
Th	131	-TATFYQYWS VRRNHR-S-S	-----GSVN	TANHFNAAWAS	HGLTL-GT 168
Sc	132	-TQTFQYFS VRNPKKAPGG	SIS---GTVD	VQCHFDAWKG	LGMLGSE 175
An	124	-TSTFTQYFS VRESTRTS--	-----GTVT	VANHFNAAWQ	HGFHN-SD 162 161
Ak	124	-TSTFTQYFS VRESTRTS--	-----GTVT	VANHFNAAWQ	HGFHN-SD 162 161
At	125	-TSTFTQYFS VRESTRTS--	-----GTVT	VANHFNAAWAS	HGFHN-SD 163
Tr1	118	-TATFNQYIS VRNSPR-T-S	-----GTVT	VQNHFNWAS	LGLHLGQM 155
Aa	131 130	TQTFQYWS VRQNKV-G-	-----GTVT	TSNHFNAAWAK	LGML-GT 168 167
Ss	128	-PAAFDQYWS VRQSKVT--S	-----GTIT	TGNHFDAAW	AGMNMGNF 168 166
SlB	130	TR-TFDQYWS VRQSKR-TG-	-----GTIT	TGNHFDAAW	AGMPLGNF 168
SlC	128	TK-TFQYWS VRQSKVTSGS	-----GTIT	TGNHFDAAW	AGMNMGNF 168
Tl	131	TQ-TFDQYWS VRQDKR-T-S	-----GTVQ	TGCHFDAW	AGLNVNGD 169
Tf	128	TR-TFDQYWS VRQSKRTS--	-----GTIT	AGNHFDAAW	HGMHLGTH 166
Bc	121	DRTTFTQYWS VRQSKRPTGS	N-----ATIT	FTNHVNAWKS	HGMNLGSN 163
Bs	121	DRTTFTQYWS VRQSKRPTGS	N-----ATIT	FSNHVNAWKS	HGMNLGSN 163

Tr2#		170	180	190	
Bp	175 174	MYETAFTVEG	YQSSGSANVM	TNQLFIGN	201 SEQ ID NO:4
Ca	207 184	MHETAFNIEG	YQSSGKADVN	SMSINIGK	233 211SEQ ID NO:6
Fs	179 178	MYEAKVLVEA	GGSGSFDV-	TYFKMT	203 202SEQ ID NO:18
Cs	178 177	MYEVALTVEG	YQSSGYANVY	KNEIRIGANP....	SEQ ID NO:7
Rf	188	LYEVS LNIEG	YRSNGSANVK	SVSV	211 SEQ ID NO:8
Tr2	169	MDYQIVAVEG	YFSSGSASI-	TVS	190 SEQ ID NO:16
Tv	169	MDYQIVAVEG	YFSSGSASI-	TVS	190 SEQ ID NO:17
Th	169	MDYQIVAVEG	YFSSGSASI-	TVS	190 SEQ ID NO:14
Sc	176	HNYQIVATEG	YQSSGTATI-	TVT	197 SEQ ID NO:9
An	163 162	FNYQVMAVEA	WSGAGSASV-	TISS	184 SEQ ID NO:1
Ak	163 162	FNYQVMAVEA	WSGAGSASV-	TISS	184 SEQ ID NO:54
At	164	FNYQVMAVEA	WSGAGSAAV-	TISS	185 SEQ ID NO:2
Tr1	157 156	MNYQVMAVEG	WGGSGSASQ-	SVSN	178 SEQ ID NO:15
Aa	169 168	HNYQILATEG	YQSSGSSSI-	TIQ	190 189SEQ ID NO:19
Ss	167	RYYMINATEG	YQSSGSSSI-	TVSG	189 SEQ ID NO:12
SlB	169	SYYMINATEG	YQSSGSSSI-	NVGG.....	SEQ ID NO:10
SlC	169	RYYMINATEG	YQSSGSSNI-	TVSG	191 SEQ ID NO:11
Tl	170	HYYQIVATEG	YFSSGYARI-	TVADVG	194 SEQ ID NO:20
Tf	167	D-YMIMATEG	YQSSGSSNV-	LGTS.....	SEQ ID NO:13
Bc	164	WAYQVMATEG	YQSSGSSNV-	TVW	185 SEQ ID NO:3
Bs	164	WAYQVMATEG	YQSSGSSNV-	TVW	185 SEQ ID NO:5

FIGURE 1 CONT'D